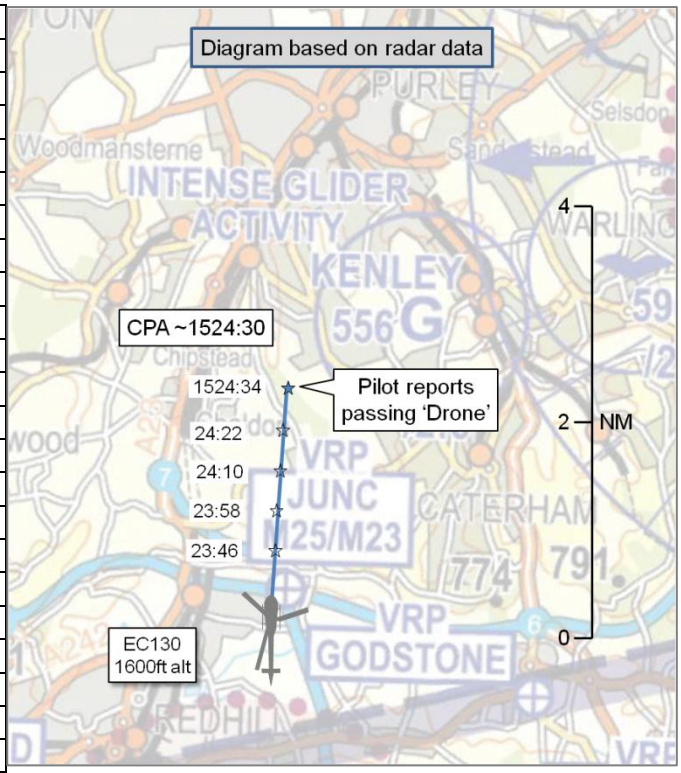
AIRPROX REPORT No 2015046

Date: 11 Apr 2015 Time: 1525Z Position: 5118N 00007W Location: West abeam Kenley (Saturday)

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

Recorded	Aircraft 1	Aircraft 2
Aircraft	EC130	Drone
Operator	Civ Comm	Unknown
Airspace	London FIR	London FIR
Class	G	G
Rules	VFR	
Service	Basic	
Provider	Heathrow SVFR	
Altitude/FL	1600ft	
Transponder	A, C, S	
Reported		
Colours	Black/gold	Black
Lighting	NK	
Conditions	VMC	
Visibility	>10km	
Altitude/FL	1600ft	
Altimeter	QNH (1023hPa)	
Heading	020°	
Speed	110kt	
ACAS/TAS	Other TAS	
Alert	Nil	
Separation		
Reported	0ft V/30m H	NK
Recorded	NK	



THE EC130 PILOT reports tracking to the Isle of Dogs for a London sightseeing tour. West abeam Kenley gliding site at 1600ft QNH, he saw what he believed to be a helium party balloon about 20° off the port side at a range of about 500m. He assessed his course would not take him near the object so he held his heading. As the object came closer, he realised that it was in fact a drone helicopter, shaped like the number 8. It passed down his port side at the same altitude, about 100ft away. The passengers on the port side also saw the drone. The pilot called Heathrow Radar, reported the incident and informed the controller that he would file an Airprox.

He assessed the risk of collision as 'Medium'.

THE DRONE OPERATOR: The Drone Operator could not be traced.

THE LONDON TERMINAL CONTROL CENTRE CONTROLLER reports acting as Group Supervisor Airports. The Thames radar controller [Heathrow SVFR] called him to state that an EC130 pilot wanted to file an Airprox against a drone that he had encountered, approximately 1 mile west of Kenley. The helicopter was at 1600ft at the time, and the pilot considered the drone to be at the same level, about 100ft away from him. This was outside controlled airspace.

Factual Background

The weather at Heathrow and Gatwick was recorded as follows:

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METAR EGLL 111520Z 27014KT CAVOK 13/M02 Q1022 NOSIG
METAR EGKK 111520Z 26012KT CAVOK 13/M00 Q1022
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Analysis and Investigation

CAA ATSI

The EC130 departed for a local flight to the north squawking 3767. Radar recording only showed an intermittent primary contact manoeuvring 4.6nm north-northwest of Redhill. This was 2.2nm west of the projected flight path of the EC130 and was judged not to have been the reported drone. At 1522:33, the EC130 is shown tracking north at an altitude of 1000ft. The intermittent contact had faded from radar, Figure 1.

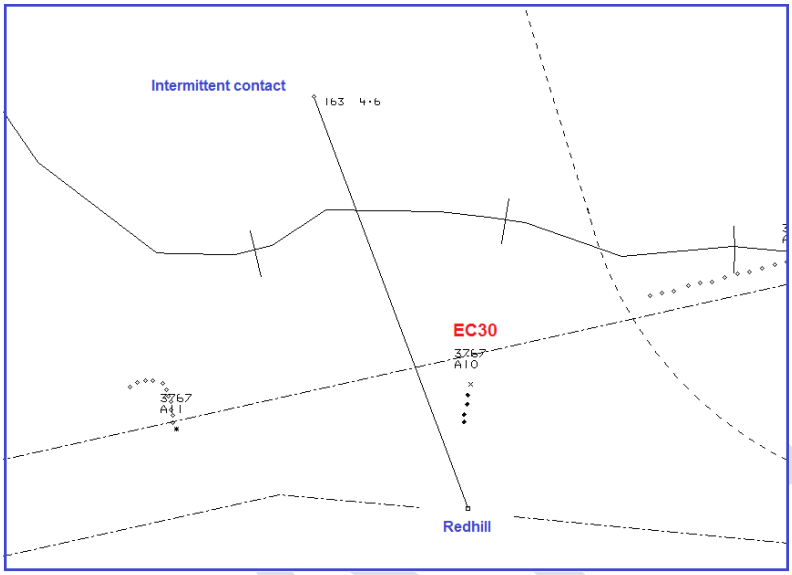

Figure 1: Heathrow single source radar at 1522:33

The EC130 pilot changed to a 7000 squawk and, at 1523:08, he contacted Heathrow SVFR. A Basic Service was agreed and the EC130 pilot was instructed to squawk 7033 with QNH 1022hPa. At 1523:33, the EC130 was 3.5nm north of Redhill and the intermittent contact was shown manoeuvring in the EC130's 10 o'clock at a distance of 2.2nm, Figure 2.

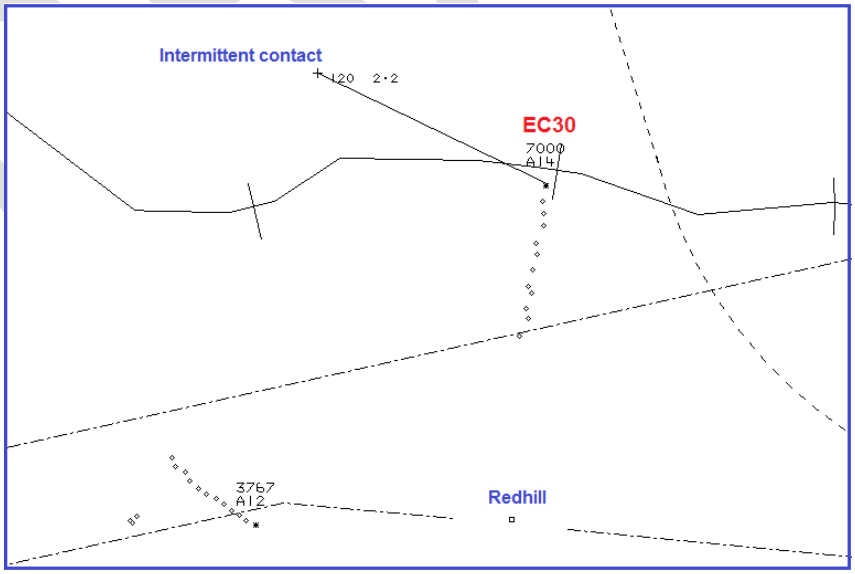

Figure 2: Heathrow single source radar at 1523:33

At 1524:22, the EC130 was 4.5nm north of Redhill at 1600ft. No other radar contacts were shown to be in the area, Figure 3.

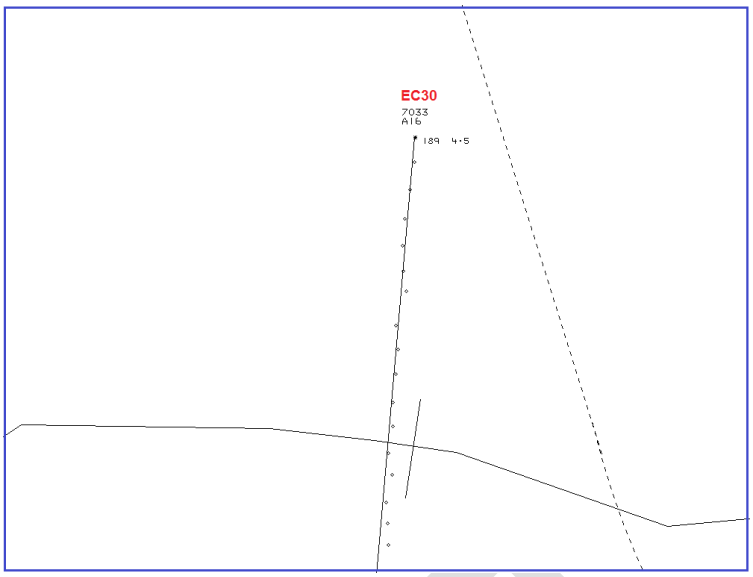

Figure 3: Heathrow single source radar at 1524:22

At 1524:34, the EC130 pilot reported being passed by a drone whilst at 1600ft. The Heathrow SVFR controller was not aware of the drone and there were no other radar contacts in the area at the time of the reported Airprox. It is unlikely that a drone would be detected by area radar.

UKAB Secretariat

The Air Navigation Order 2009 (as amended)[1], Article 138 states:

> 'A person must not recklessly or negligently cause or permit an aircraft to endanger any person or property.'

Article 166, paragraph 2, states:

> (2) The person in charge of a small unmanned aircraft may only fly the aircraft if reasonably satisfied that the flight can safely be made.
> (3) The person in charge of a small unmanned aircraft must maintain direct, unaided visual contact with the aircraft sufficient to monitor its flight path in relation to other aircraft, persons, vehicles, vessels and structures for the purpose of avoiding collisions.

A CAA web site[2] provides information and guidance associated with the operation of Unmanned Aircraft Systems (UASs) and Unmanned Aerial Vehicles (UAVs). Additionally, the CAA has published a UAV Safety Notice[3] which states the responsibilities for flying unmanned aircraft. This includes:

> 'You are responsible for avoiding collisions with other people or objects - including aircraft.
>
> Do not fly your unmanned aircraft in any way that could endanger people or property.
>
> It is illegal to fly your unmanned aircraft over a congested area (streets, towns and cities).
>
> Also, stay well clear of airports and airfields'.

The CAA issued SI 2015/02 (Issue 1), AIRPROX Involving Small Unmanned Aircraft, on 8 May 2015. This is an amendment to the Airprox reporting procedure at Section 6, Chapter 3 of CAP 493 (Manual of Air Traffic Services Part 1) and states that reporting action at aerodromes and

[1] Article 253 of the ANO details which Articles apply to small unmanned aircraft. Article 255 defines 'small unmanned aircraft'. The ANO is available to view at http://www.legislation.gov.uk/uksi/2009/3015/contents/made.
[2] www.caa.co.uk/uas
[3] CAP 1202

ACCs is to include notification to civil police of the location of the Airprox as soon as practicable to initiate tracing action. The SI is included at Annex A to this report.

Summary

An Airprox was reported when an EC130 helicopter and a Drone flew into proximity at about 1525 on Saturday 11th April 2015. The EC130 pilot was operating under VFR in VMC in the Class G airspace of the London FIR and in receipt of a Basic Service from Heathrow Radar.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available consisted of a report from the EC130 pilot, radar photographs/video recordings, a report from the air traffic controller involved and a report from the appropriate ATC authority.

Members quickly agreed that the drone operator was probably not in direct visual contact with the drone at the altitude reported (at or above 1000ft above ground level) and had either lost control of the drone (which had then strayed in height) or was perhaps using a First Person View (FPV) system[4] which requires a competent observer to be present in order to detect converging aircraft, (but who would be similarly hampered by difficulties in maintaining direct visual contact with the drone at such a height). It was also noted that the relevant ANO Articles (which may also be found at www.caa.co.uk/uas) state that a person in charge of a small unmanned aircraft may only fly the aircraft if reasonably satisfied that the flight can safely be made, and must maintain direct, unaided visual contact with the aircraft sufficient to monitor its flight path in relation to other aircraft, persons, vehicles, vessels and structures for the purpose of avoiding collisions. In short, as the CAA website states, "The operation [of the drone] must not endanger anyone or anything". The Board opined that, in collision avoidance terms, the perception and definition of 'endanger' could be very different between an experienced aviator and a person with no aviation experience at all.

As for the EC130 pilot, the Board noted that he had seen the drone at range and, although under the impression it was a balloon, had elected to continue on his course. Some members felt that it may have been more prudent to increase separation anyway if possible (even if it had turned out to just be a small party balloon), rather than accept reduced separation from an object in the air. Nevertheless, it was agreed that it had been the EC130 pilot's subsequent concern at the proximity of the drone that had resulted in an entirely appropriate Airprox report.

Finally, the Board observed that drone operators have the same right to conduct their business or leisure activities in UK airspace, and especially so in Class G, as do other airspace users. However, after much discussion, it was agreed that the reality of current drone technology and its increasing sophistication appeared to be outstripping the regulatory framework required to ensure safe operation in a shared aviation environment. Members agreed that drone collision was especially hard to mitigate with current legal provision, and that expressions such as 'endanger' were open to interpretation, especially by non-aviators who may not have an appreciation for the risks that were involved. Ultimately, operators of drones of less than 7kg mass were required to maintain at least 50m from any third parties but, in the dynamic air-to-air case, the Board opined that judging 50m to any degree of accuracy from the ground was practically unachievable and therefore largely unworkable as a rule. This particular Airprox had highlighted the problem with these rules, the drone may or may not have been within 50m from the EC130, and might therefore have satisfied the legal minimum, but there was no real ability to conduct that assessment even for experienced pilots.

[4] First Person View flying is the ability to control a radio controlled aircraft from a "pilot's eye" perspective through the use of an on-board camera and ground-based receiving and viewing equipment. The viewing equipment is normally a set of video goggles. FPV systems usually involve on-board flight control, navigation and camera systems to transmit an image to the operator on the ground. CAA ORS4 No 1108 (available at http://www.caa.co.uk/docs/33/1108.pdf) dated 6 May 2015 requires that, amongst other rules, to fly under FPV the drone must not exceed 3.5kg, it must not be flown in CAS or above 1000ft, and that the person in charge is accompanied by a competent observer who maintains direct unaided visual contact with the SUA sufficient to monitor its flight path in relation to other aircraft, persons, vehicles, vessels and structures for the purpose of avoiding collisions and advises the person in charge accordingly.

Furthermore, the issue of who should avoid whom was not clear; the operator of a stationary drone might not be able to see an approaching aircraft in time to take meaningful avoiding action, and might well have an expectation that the other aircraft would in any case avoid his drone if it was either stationary in position and height and thus being 'overtaken', or was on the right-hand side of the approaching aircraft in a converging situation (SERA 3210 (Right of Way) does not mention drones specifically, so the assumption may be that they come within the classification 'power-driven heavier-than-air aircraft', and that normal priviliges apply in that respect).

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The EC130 pilot was concerned by the proximity of the Drone.

Degree of Risk: C.

Supplementary Instruction (SI)
CAP 493 MATS Part 1

Safety and Airspace Regulation Group

Intelligence, Strategy and Policy

Number 2015/02 (Issue 1)

Issued: 8 May 2015

Effective Date: 8 May 2015

AIRPROX Involving Small Unmanned Aircraft

1 Introduction

1.1 A marked increase in the number of AIRPROX reports involving small unmanned aircraft (more generally referred to as 'drones') has occurred recently. A common theme through these recent reports is that the encounters have been reported at altitudes above 1,500 feet, which is in almost all cases well beyond a height that the person flying the 'drone' will be able to maintain visual contact with it, and the airspace around it.

1.2 The purpose of this Supplementary Instruction is to amend the AIRPROX reporting procedure within CAP 493 - Manual of Air Traffic Services Part 1 when an AIRPROX report involving a small unmanned aircraft is reported to ATC.

2 Background

2.1 A small unmanned aircraft is defined within the Air Navigation Order (ANO) as 'any unmanned aircraft, other than a balloon or a kite, having a mass of not more than 20 kg without its fuel but including any articles or equipment installed in or attached to the aircraft at the commencement of its flight.' This definition is all encompassing and includes traditional 'model aircraft' as well as the newer 'multicopter' types, whether they are being used recreationally or for commercial purposes. Small unmanned aircraft operations are specifically regulated by ANO 2009 articles 166 and 167; however, ANO 2009 article 138 (endangerment) also applies.

2.2 Because of their relatively simple nature, unless specific approval has been given, a small unmanned aircraft must always be operated within the direct visual contact of the person flying it so that they can avoid collisions with other aircraft. ANO 2009 article 166(3) specifically states:

> 'The person in charge of a small unmanned aircraft must maintain direct, unaided visual contact with the aircraft sufficient to monitor its flight path in relation to other aircraft, persons, vehicles, vessels and structures for the purpose of avoiding collisions.'

2.3 Unlike manned aviation, tracing the person in charge of small unmanned aircraft is extremely challenging, due to their remoteness from the aircraft itself. Therefore, speed of reporting is essential so that the operator can be located, particularly if it is likely that the aircraft is being operated in a manner that is likely to endanger others (e.g. in close proximity to another aircraft and/or at an excessive height). In order to achieve this, Air Traffic Service Units receiving an AIRPROX report involving what is

thought likely to be a small unmanned aircraft must inform the Civil Police as soon as practicable.

3 Revised MATS Part 1 Procedures

3.1 With immediate effect, CAP 493 is amended as shown at Appendix A.

3.2 This change will be incorporated into CAP 493, Edition 6 at Amendment 2 in due course.

4 Queries

4.1 Any queries or further guidance required on the content of this SI should be addressed to:

ATS Enquiries
Intelligence, Strategy and Policy
CAA Safety and Airspace Regulation Group
2W Aviation House
Gatwick Airport South
West Sussex
RH6 0YR

E-mail: ats.enquiries@caa.co.uk

4.2 Any queries relating to the availability of this SI should be addressed to:

ATS Documents
Intelligence, Strategy and Policy
CAA Safety and Airspace Regulation Group
2W Aviation House
Gatwick Airport South
West Sussex
RH6 0YR

E-mail: ats.documents@caa.co.uk

5 Cancellation

5.1 This SI shall remain in force until incorporated into CAP 493 or it is revoked, suspended or amended.

Appendix A

Glossary

Definitions

Small Unmanned Aircraft Any unmanned aircraft, other than a balloon or a kite, having a mass of not more than 20 kg without its fuel but including any articles or equipment installed in or attached to the aircraft at the commencement of its flight. (ANO)

Abbreviations

SUA Small Unmanned Aircraft

Section 6: Chapter 3: Aircraft Accident, Incident and AIRPROX Reports

Paragraph 3: Reporting Action at Aerodromes

Table 2

Circumstances of an Incident	Reporting Action by telephone to	Subsequent Action
AIRPROX Report	ACC Watch Manager Aircraft Operators Other ATSUs involved	Dispatch CA 1094A. SRG 1602 from all concerned to Safety Data.
AIRPROX Report involving SUA	Civil Police: Provide location of AIRPROX as soon as practicable to initiate tracing action ACC Watch Manager Aircraft Operator Other ATSUs as necessary	

Section 6: Chapter 3: Aircraft Accident, Incident and AIRPROX Reports

Paragraph 4: Reporting Action at ACCs

Table 3

Circumstances of an Incident	Reporting Action by telephone to	Subsequent Action
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AIRPROX Report involving SUA	Civil Police: Provide location of AIRPROX as soon as practicable to initiate tracing action Aircraft Operator Other ATSUs as necessary	